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INSTALLATION FOR HEAT TREATMENT AND DRYING OF NONCONDUCTING MATERIALS OF S.G. ROMANOVSKIY

by

S.G. Romanovskiy

PARTIALLY EDITED MACHINE TRANSLATION

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yё or ё.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

GRAPHICS DISCLAIMER

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INSTALLATION FOR HEAT TREATMENT AND DRYING OF NONCONDUCTING MATERIALS OF S. G. ROMANOVSKIY.

S. G. Romanovskiy.

Are known installations for heat treatment and drying of nonconducting materials, for example wood, which contain chamber with electromagnetic winding, fed by power currents, and heat-producing elements, for example, made of ferromagnetic steels, arranged/located between layers of dried out material.

Purpose of invention - intensification of heat exchange and increase in efficiency.

Goal is achieved by the fact that contiguous phases of electromagnetic winding are close to one another with opposition connection of middle winding relative to extreme and fuel-producing elements are mixed in material with their overlap in contiguous phases for providing between latter of magnetic coupling, each phase of winding can be equipped with additional regulating winding, located in outer layer, and heat-producing elements are distributed on phases unevenly: their quantity in average/middle phase is less, for

example, by one third, than in contiguous phases. Heat-producing elements can be carried out in the form of grids, lattices of wire of round cross section with distance between the adjacent rods not more than two-three of their diameters, in this case the grids and lattices are mixed beyond the limits of phases at distance of 15-20 cm.

Fig. 1 schematically depicts the described chamber, Fig. 2 gives axonometric projection of chamber, Fig. 3 shows stack of material with heat-producing elements arranged/located in it with discrete-conductive and convective heat supply, in Fig. 4 - stack with heat-producing elements with radiation-convective heat supply, Fig. 5 depicts heat-producing element (lattice) in plan/layout, in Fig. 6 - section along A-A in Fig. 5 with straps from ferromagnetic steel or aluminum, in Fig. 7 - section along A-A of Fig. 5 with straps from wood or unburning dielectrics, in Fig. 8 - heat-producing element (grid), Fig. 9 gives electric circuit of installation with opposition connection of middle winding, in Fig. 10 - version of electric circuit of start of electromagnetic windings.

In chamber 1 is installed stack 2 of dried out materials, in which are placed heat-producing elements 3, made either in the form of lattices 4 (Fig. 5, 6, 7) or in the form of grids 5 (Fig. 8) from wire of round cross section. In this case the distance between contiguous rods of 6 grids is expedient to make not more than two-three diameters of rods. Material is heated with the aid of the electromagnetic winding, fed by power currents.

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The contiguous phases of inducing winding 7 are arranged/located close to one another with the distance between the turns of adjacent phases not more than 5-10 cm. Average/middle winding has opposition connection relative to extreme (Fig. 9). For the total exclusion of the skew of phases the zero point can be grounded. Windings it is preferable to make from aluminum (copper) buses of right angled or square cross-section, which makes it possible to create uniform magnetic field with high density. Additional regulating windings 8 are assembled in the outer layer.

Heat-producing elements in stack are placed in such a way that in average/middle phase their quantity is approximately 1/3 less than in contiguous phases. This also makes it possible to decrease the skew of phases and to ensure the uniform heating of material on entire stack. The heat-producing elements of each phase have a length, which exceeds the distance between the extreme turns of this phase; therefore during their arrangement into the stack the elements of contiguous phases cover one another no less than by 15-20 cm. The limits of the final turns of outer windings come out in favor of so many elements. Thus magnetic coupling between the contiguous phases of winding is provided. Heat-producing elements can be put in the stack according to different diagrams. Fig. 3 depicts the stack, whose drying proceeds with discrete-conductive heat supply from the elements, which have contact with the worked material, and convective heat supply from all elements as a whole. The leading role plays in

this case emission. In the stack, depicted on Fig. 4, the heat supply is realized from the elements, which are not contacted with the material, and therefore drying occurs in radiation-convective manner.

Object of invention.

1. Installation for heat treatment and drying of nonconducting materials, for example wood, that contains chamber with the electromagnetic winding, fed by power currents, and heat-producing elements, for example, made of ferromagnetic steels, arranged/located between the layers of the dried out material, that is characterized by the fact that for the purpose of the intensification of heat exchange and increase in the efficiency, the contiguous phases of electromagnetic winding are arranged/located close to one another with the opposition connection of average/middle winding relative to extreme and heat-producing elements are placed in the material with their overlap in the contiguous phases for providing between the latter magnetic coupling.

2. Installation according to p. 1, which is characterized by the fact that each phase of winding is equipped with additional regulating winding, located in outer layer.

3. Installation according to p. 1, which is characterized by the fact that heat-producing elements are distributed on phases unevenly with their quantity in average/middle phase one third less, for

example, than in contiguous phases.

4. Installation according to p. 1, which is characterized by the fact that heat-producing elements are carried out in the form of grids, lattices of wire of round cross section with distance between adjacent rods not more than two-three of their diameters; moreover grids or lattices are placed beyond limits of phases at a distance of 15-20 cm.

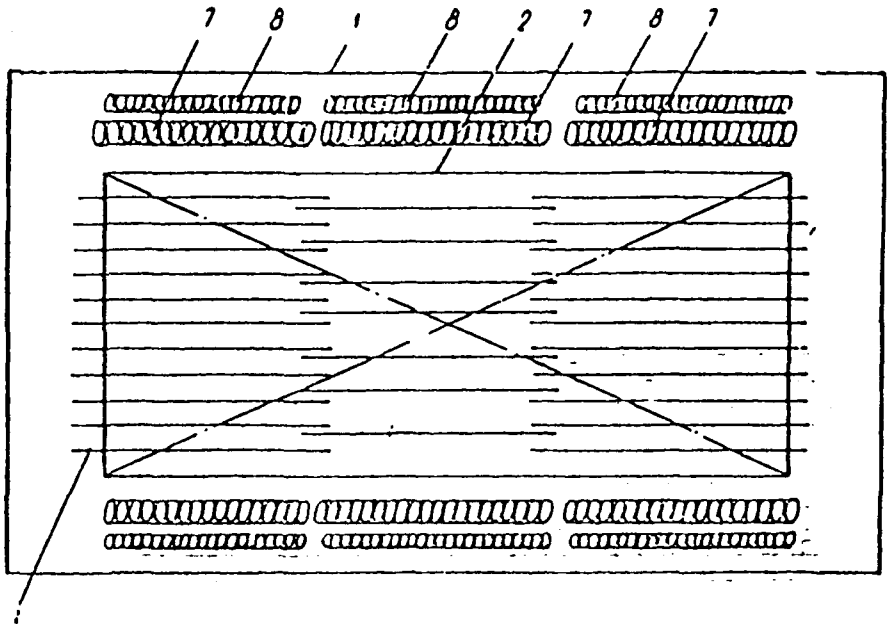

Fig. 1.

Page 3.

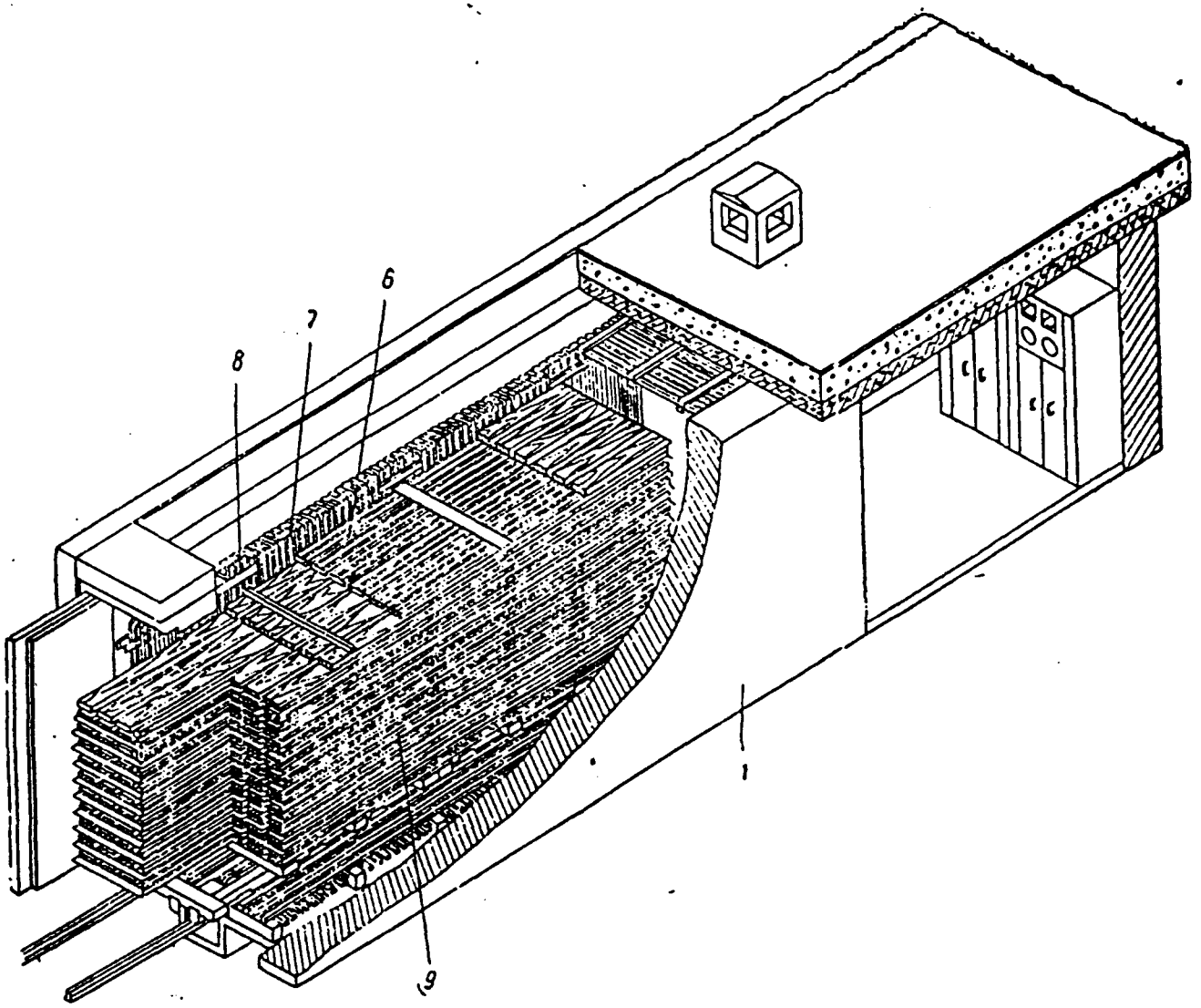

Fig. 2.

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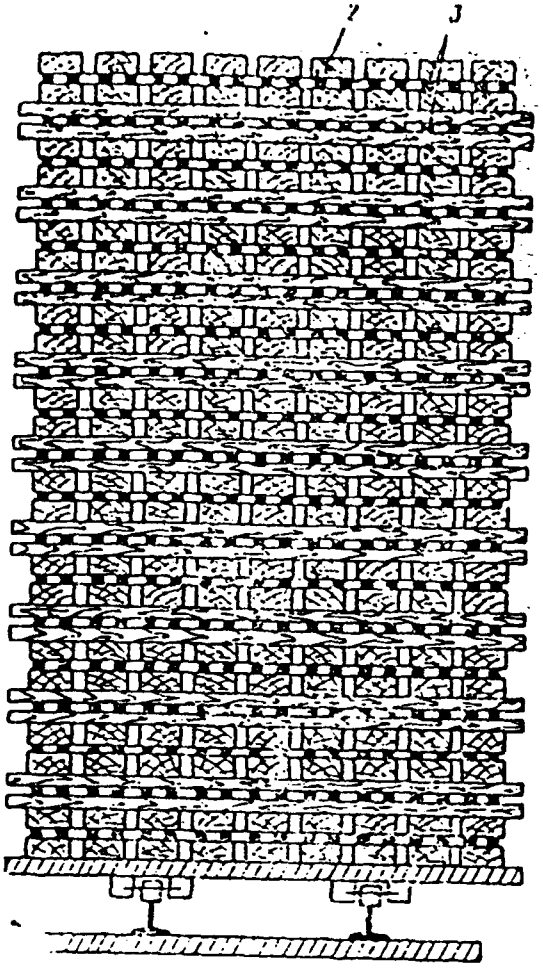

Fig. 3.

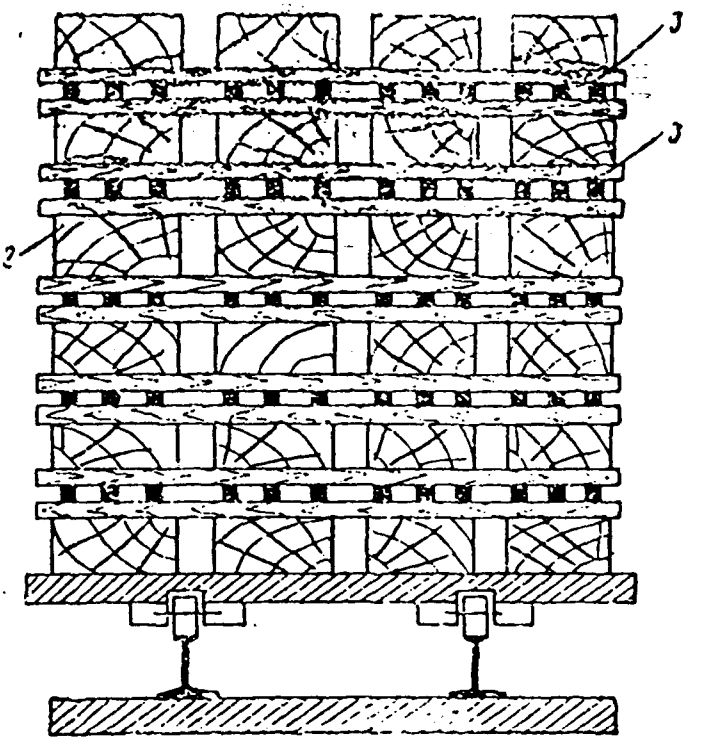

Fig. 4.

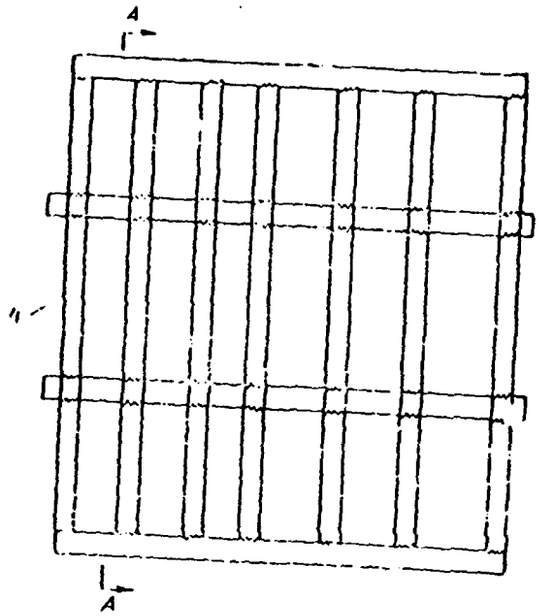

Fig. 5.

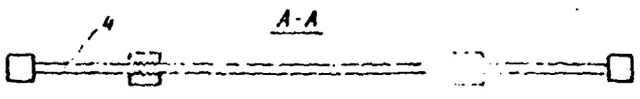

Fig. 6.

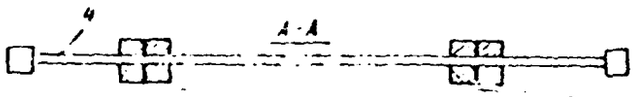

Fig. 7.

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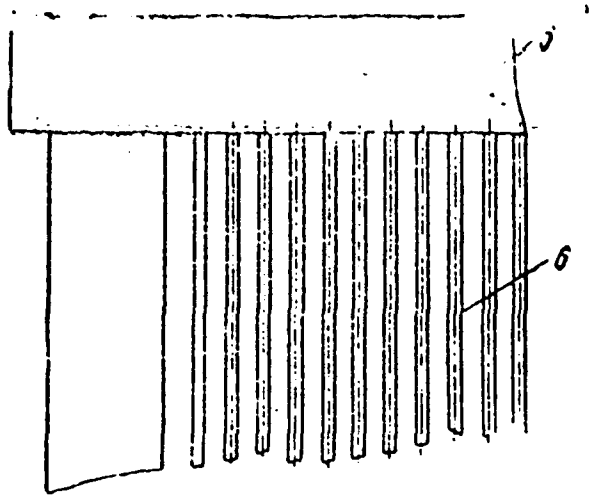

Fig. 8.

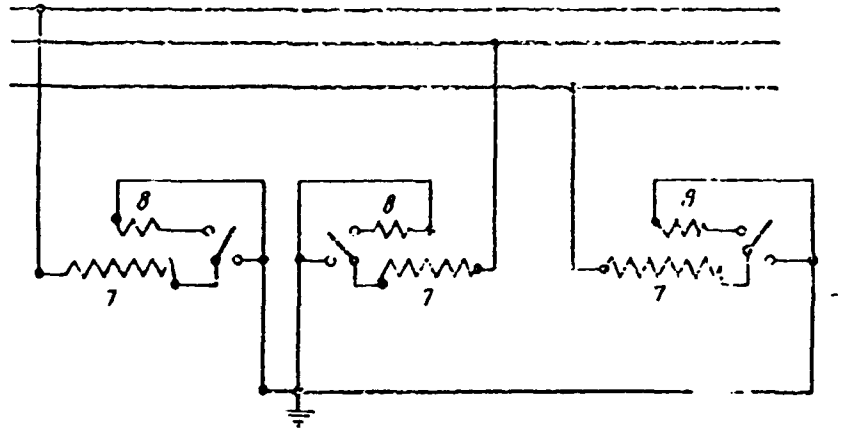

Fig. 9.

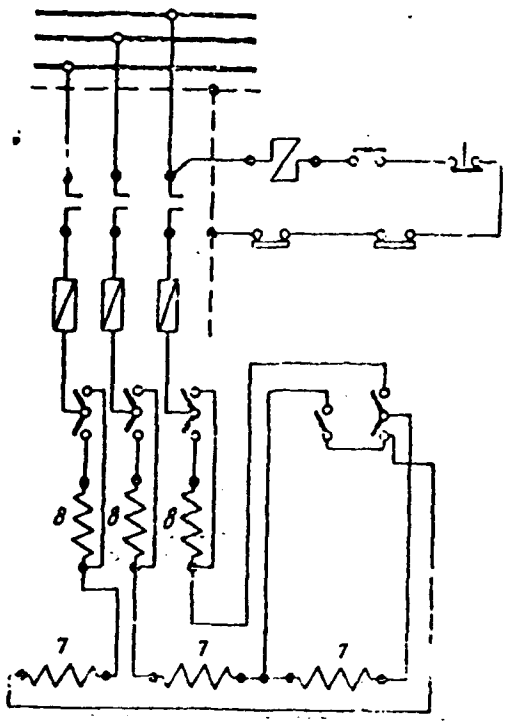

Fig. 10.